What is claimed is:

1. A method of optically measuring black carbon in the atmosphere, comprising the steps of:
depositing aerosols from a stream of air onto a filter tape,
illuminating an aerosol particle collection area of said filter tape continually by an illumination source with light of one or more wavelengths,
measuring simultaneously light fractions both transmitted through and reflected from said filter tape at several precisely defined angles/angle ranges by means of photodetectors arranged correspondingly relative to said illumination source in achieving maximum symmetry for the angles to be measured, and
determining continually the loading of said filter tape collection area with light-absorbing aerosol material from the change in the optical properties of said collection area caused by said loading with the aid of known algorithms from transmissivities and reflectivities as detected.

2. The method as set forth in claim 1 wherein said transmitted and reflected light fractions are measured at angles/angle ranges of 0°, 120 to 140° and 165 to 180° and then averaged.

3. The method as set forth in claim 1 or 2 wherein in measurement at a single wavelength only a narrow-band light source is employed.

4. The method as set forth in claim 3 wherein a color LED is used as said narrow-band light source.

5. The method as set forth in claim 1 or 2 wherein in measurement at several wavelengths use is made of a wideband light source and bandpass filters are employed upstream of said individual light detectors.

6. The method as set forth in claim 1 wherein the light intensity of said illumination source is measured and determined continually.

7. An apparatus for implementing the method as set forth in any of the claims 1 to 6 in the form of a measuring head (1) comprising a illumination source (2) arranged above a filter tape (6),
a photodetector (7) beneath said filter tape (6) for measuring transmitted light fractions and
photodetectors arranged between said illumination source (2) and said filter tape (6) for measuring reflected light fractions
wherein, in each case, at least two of said photodetectors arranged between said illumination source (2) and filter tape (6) are provided opposite each other in ring-shaped mounting devices (7_1, 7_2) relative to said optical axis of said illumination source (2) and are oriented at precisely defined angles/angle ranges θ of 0°, 120 to 140° and 165 to 180° relative to said filter tape surface, and
units (20, 21) for determining the loading of said filter tape with light-absorbing material are arranged downstream to said photodetector beneath said filter tape and said photodetectors arranged opposite each other.

8. The apparatus as set forth in claim 7 wherein to reduce scattered light said photodetectors provided opposite each other are accommodated in two ring-shaped mounting devices (7_1, 7_2) located at two different planes.

9. The apparatus as set forth in claim 7 or 8 wherein a LED (3) is provided for monitoring said light intensity of said illumination source (2).

10. The apparatus as set forth in claim 7 wherein in said measuring head (1) a dusting passage (12) is configured so that in addition to continual dusting of said filter tape (6) also coarser particles (>10μm) gain access to said filter tape.

11. The apparatus as set forth in claim 10 wherein a preseparator is provided upstream of said dusting passage (12) for size selection of said particles.